

**MINISTRY OF PUBLIC HEALTH OF UKRAINE
NATIONAL UNIVERSITY OF PHARMACY**



**METHODICAL RECOMMENDATIONS
FOR THE IMPLEMENTATION OF THE MASTER'S DEGREE WORK
ON PHARMACOGNOSY
FOR FOREIGN STUDENTS**

Kharkiv
2014

UDC: 615.322 (072)

Approved by CMC of National University of Pharmacy (protocol №1 from 26.02.2014).

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Edition contains materials on Master's degree work implementation: a structure of Master's degree work, requirements to the works, a list of documents for defence, a procedure of defence.

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INTRODUCTION

Pharmacognostic scientific school of the National University of Pharmacy has many years of traditions and research directions. At first research objects of scientists of Pharmacognosy Department were essential and fatty oils of species from Ukrainian flora, morphological and anatomical analysis of medicinal raw material (MRM) (herbal drugs – HD).

Later the study of phenolic compounds and search in complex processing of herbal drugs were started. Nowadays the staff of the Department search for new biologically active substances (BAS) in HD, which are used in traditional medicine, search for new BAS in medicinal and agricultural plants and their salvages; carry out synthesis of analogs of natural flavonoids, anthraquinones, cardiosteroids, carry out standardization of herbal drugs, develop and standardize herbal medicines, study resource base of medicinal plants.

During the last years drugs "Glyphasine", "Oxaglycamine", "Flavanobol", "Lucerine", "Ononin-standard", "Piflamin", "Fitocardin" have been developed.

These methodical recommendations are developed for the implementation of Master's degree work by foreign students on discipline "Pharmacognosy" for obtaining the qualification of Master's Degree, developed according to modern standards GOST 7.1:2006 "System standards of information, bibliographical and publishing. Bibliographic description. General requirements and rules of drafting."

This edition contains a detailed description of Master's work implementation: planning, text layout, defence. A list of necessary documents to the Master's work is attached.

In addition to the main text pay attention on Appendixes illustrating examples of support documentation.

1. Master's work as a test of students' professional knowledge and skills with the purpose of state control

1.1. General rules for successful planning of master's work

Modern pharmacognosy is an applied specialized science that studies the morphological and anatomical, diagnostic features of herbal drugs, the chemical composition of plants and herbal drugs, their pharmacological properties, medicinal raw materials of animal origin and products of its processing.

There are several directions of Pharmacognosy research: the study of the chemical composition of herbal drugs, biosynthetic pathways and dynamics of biologically active substances formation, their accumulation in organs and tissues during plant ontogenesis and under the influence environmental factors; research of optimal conditions for harvesting, drying and storage of herbal drugs; developing drugs based on plant BAS; standardization of herbal drugs and phytopreparations.

More attention is given to the development of pharmacopeial monographs projects and the revision of existing regulatory documents; improving methods on the determination of identity, purity and high quality of herbal drugs; resource studies.

Master's work on Pharmacognosy is a form of state attestation of knowledge and skills of students of the National University of Pharmacy.

Master's work is carried out by students of 5-th year and is the final stage of the scientific research plan. It should be complex and contain elements of pharmacognosy, pharmaceutical chemistry, clinical pharmacy and pharmaceutical care.

The work contains a review of scientific primary sources and includes the results of own experimental studies.

It aims to check the theoretical knowledge and practical skills of students, the ability to formulate problems, the research relevance, systematize and generalize results.

To plan and implementation the work successfully its necessary to carry out a detailed analysis and to develop the draft of the scientific study with the following components: choice of topic of scientific research and formulation of the problem of scientific research, the relevance of the research study; the definition of the subject and

object of research; setting purpose and tasks of the study, total and working hypothesis; the choice of research methods, a research plan; predicting the expected results, theoretical and practical importance of the work.

To choose the topics its necessary to study issues of the chosen problem that are little explored. The contradiction is that there is a need of society and modern science in some researches, but they were not carried out.

General and working hypothesis are put forward for a more clear tasks of the study. The general hypothesis: if investigate the chemical composition of the extract and identify classes of BAS, it will help determine probable pharmacological activity of substance. The working hypothesis is focused on the implementation of general.

There are several methods of scientific research:

Historical – contains an analysis of existing information on this topic or problem.

Experimental – methods which are used for making experiments, different methods of analysis.

Statistical – without statistical analysis of results experiment can not be regarded as probable that is why statistical methods of analysis are employed.

1.2. *Choosing the topic of master's work*

Topic of the work should correspond to modern problems, that is to be relevant and aimed to solve a particular problem. The work should be done in accordance with the scientific direction of the department and be in the context of modern pharmaceutical science.

For the successful planning of master's work its necessary to achieve the following objectives: to conduct a patent search on area of planned study to analyze objectively and fully the information on this topic; conduct a bibliographic search and organize obtained knowledge, skills and information; establish the object and purpose of the study; to evaluate the novelty and practical importance of the work that is planned; make a plan of the work.

1.3. Object and subject of study. Setting purpose and tasks of the study

Choosing of *objects* of study is an important task in the planning of the master's work. The objects of pharmacognostic study are: herbal drugs, products of their processing – tinctures, extracts, BAS and methods of their research.

The purpose of the study is formulated basing on the expectation of a particular result. A clearly defined purpose contributes to more effective implementation of scientific research.

Tasks of the research are made according to the purpose and are tools for its implementation. For example: for phytochemical analysis of medicinal plants is necessary to determine the qualitative and quantitative content of BAS: flavonoids, coumarins, hydroxycinnamic acids.

1.4. The algorithm of master's work implementation (main stages)

Main stages of Master's work implementation:

1. The preparatory phase. Graduate students choose the topics of master's works. Supervisors are members of academic teaching staff of the graduating department.

The topic of master's work should be individual and approved with the candidate of supervisor in the department meeting, and then by the appropriate decree of the university on the basis of statements of the student.

After the order approving the topic of master's work, student and supervisor developed structure and calendar plan of master's work performance.

Task for master's work should contain the signatures of the student, supervisor and head of the department on which the work is performed.

It should be noted that comments of the supervisor must be taken into account.

2. Theoretical and experimental (main) stage. At this stage the student in accordance with the instructions of the supervisor, directly performs the work according to the the calendar plan. Upon completion of research and making work, it is signed by the student and scientific supervisor.

3. The final stage. At this stage, before the submission and defence of master's work for Secretary of State Examination Commission (SEC) previous defence on

department and receiving reviews of supervisor and recesent persen on master's work are done.

During working of the master's works Department of pharmacognosy provides the students with methodical materials, reagents and equipment for scientific research.

1.5. Defence of master's work

On completion of master's degree work implementation and passing the previous defence of the work on the graduating department, remarks are removed, decision for admitting the work to official defence in SEC is made and reviewers are appointed.

Reviewers are selected from the profile specialists (professors, associate professors) of University departments.

After reviewers remarks the author of the work must: correct remarks and complete the work; to make hardcover of the work and get a sign of the supervisor; prepare the electronic copy of work; get the reviews of supervisor and reviewers on the work.

The defence of the master's work is performed with the presence of examination committee and faculty management. An electronic version of master's work should be provided to the department, which is stored for 2 years.

For the official defence of master's degree work on the meeting of SEC the student makes a report in which such questions are illuminated: urgent of research topic; object, aim and tasks of research; methods used for research realization; basic results of research; novelty and practical meaningfulness of undertaken study; general conclusions.

The report should be clear, consistent, reasoned, last no more than 20 minutes and be followed with the multimedia presentation using MS PowerPoint editor.

Presentation slides should be informative and good read (light letters on a dark background or black letters on a light background). For members of the SEC separately printed tables which form presentation – an additional material should be done.

The final of report must contain conclusions and recommendations on questions discussed in the master's works.

After the report the author answers questions of SEC Head, of members and the audience.

After discussing of the work, after all defenses, Head of the commission cites documents obtained (text of the work, reviews, speeches, answers on questions and comments) announces mark, which was agreed by all members of the commission.

The Appeal

In case of disagreement with the mark obtained after the defence of master's work, the student has a right to submit an application addressed to the Head of SEC asking to review the work, indicating those moments that were not included in the defence. In considering the appeal, if it is reasonable, re-protection is designated upon the completion of all defences. Mark after the re-protection is put finally and is not subject to revision.

Storage of the work

The work together with the review of the scientific supervisor is stored in the archive of the University.

2. Documents attached to the master's work defence

1. The task for work and calendar plan (Appendix 1).

Task for master's work the student receives after choosing and approving the theme of work. Calendar plan is developed by a student together with the supervisor and includes tasks on the topic, time of execution in accordance with the work schedule.

2. Protocol of the meeting of SEC (Appendix 2).

3. Submission for head of the State examination commission for defence of master's degree work (Appendix 3).

4. Extract from protocol of Pharmacognosy Department meeting with the recommendation to the defence of master's work.

Theme of the work is contemplated at the meeting of Pharmacognosy Department and the extract from the protocol is made which admittes work to defence. The extract is signed by the Head of the department and a secretary.

Students get this extract at the department.

5. A comment of the scientific supervisor on the master's work (Appendix 4).

This is the supervisor's assessment of the level of work copmletion. In the recall scientific supervisor indicates to the following: the volume of work, the main content, compliance to the stated objectives, indicates positive and negative aspects of work, its urgency and novelty, conformity of work's completion to the existing regulations.

Supervisor characterizes students personality, his independence, systematicity, responsibility, scientific erudition.

7. Review of the master's work (Appendix 5).

This is a critical review on the master's work, provided by highly qualified specialists, scientific and pedagogical staff of related departments of the University and provides an assessment of the master's work.

Reviewer characterizes each chapter focusing on the urgency of work, accordance of its content to the stated objectives and an overall assessment of the work is given.

3. The structure, content and volume of the master's work

Master's work is written in English, by computer printing method, using graphics device and computer. The total volume of work includes the title page, introduction, overview part, experimental part, the list of references and appendices. The recommended volume for the master's work is 40–60 pages. Each chapter (except the introductory part) must end with conclusions.

It should be noted that befor planning and execution of research student must hold a patent information search, an aim of which is to identify ways to solve the problem under investigation, the study of foreign experience, identifying of specialists who deal similar developments, it is necessary to prove the novelty of work.

Structural elements of the work should be arranged in the following order:

1. Title page.
2. Contents.
3. List of conventional signs.
4. Introduction.

Main part

5. Literature review.
6. Experimental part.
7. General conclusions.
8. References.
9. Appendices (if needed).

3.1. Title page

It is the first page of work that contains information about the Institution, where the work was performed, name of institution, name of the graduating department and master's work topic.

First name, second name of student and supervisor (indicating academic degrees and staff) are given; course of studies and the group where the student studied are specified.

The text of the title page is written in Times New Roman 14 size (Appendix 6).

3.2. Content

Content is a complete list of titles of chapter, subchapters, paragraphs, subparagraphs that are listed consecutively in the order in which they are in the work with an indication of the page number. Text of contents is placed on the left of page, number of pages – on the right side. Headlines should be printed through one line each.

3.3. List of conditional signs, symbols, abbreviations, terms

If in the work specific terminology and abbreviations are used, they are given in form of list with decryption on a separate page in a separate list. This list is placed in front of Introduction. The list is printed in two columns, the left – abbreviations, the right one – a detailed explanation of terms. Abbreviations are placed alphabetically.

3.4. Introduction

The introductory part should be not more than 2 pages of printed text, and include an explanation of the motivation for the choice of topic. A prospective of the chosen research problem is show.

3.5.Literature review

This is the chapter analyzing existing information of the research subjects using bibliographic sources. It should not exceed 20% of the total work. All information, given in the chapter, should be accompanied by references to bibliographic sources.

3.6. Experimental part

A most important part of master's work. It contains main results, obtained during the experiment and consists of several chapters. In this part conclusions are formulated and results are ordered. The volume of this part should be equal to 60% of the work.

3.7. General Conclusions

General conclusions are drawn after the experimental part on a separate page and are a generalization of work according of the results obtained. General conclusions should: highlight the degree of achievement of objectives set by the researcher at the beginning of the experiment; contain answers to the questions in the paper. The practical value of work, the possibility of its implementation, etc are determined.

3.8. References, used for the work implenemtation

In the text of work reference to bibliographical sources must be. This list contains all scientific original source that the author used when writing the work. References in the text must comply with the ordinal number on the list. Reference is placed at the end of the sentence in square brackets (for example, "... using the methods of paper chromatography [3]").

Bibliographic list of sources is given after the "General conclusions" from the new page. Bibliographic list of sources is done according to one of the following ways of grouping: alphabetical grouping – the arrangement of sources in alphabetical order of

names of authors or titles (when the number of authors is more than four), the description of works of authors with the same last name are placed in alphabetical order based on their initials and works of one author are placed in alphabetical order of their names; consistent group ping is the location of the sources in order of this mentioning in the text of work. Examples of formatting of list of references are shown in the table.

Table 1

Examples of bibliographic description

Characteristics of the source	Example
Monographs (one, two or three authors)	Popovich, V. P. Hepatoprotective potential of plants: Monograph. / V. P. Popovic, B. P. Hromovyk, V. A. Syatynya. – K.: Interservice, 2012. – 188 p.
One author	Cherepanov, S. K. Vascular Plants of the USSR / S. K. Cherepanov. – Leningrad: Nauka, 1981. – 510p.
Two or three authors	Tumanov, V. N. Qualitative and quantitative research the methods of pigments photosynthesis / V. Tumanov, S. L. Chirik. – Grodno Gr Univ. Kupala, 2007. – 62 p.
Four authors	Homeopathic medicines are allowed in the Russian Federation for use in public health and veterinary / A. V. Patudin, V. Mishchenko, L. I. Iliencko, L. V. Kosmodemyansky. – M. "Zodiac", 2011. – 352 p.
Multivolume edition	Chernogorod, L. B. Essential oils of some species of the genus Achillea L., containing fragranol / L. B. Chernogorod, B. A. Vinogradov / / Plant Resources. – 2006. – Vol. 42, no. 2. – P. 61-68.
Compilations of scientific works	Isoflavones of roots Phaseolus aureus / S. V. Kovalev, V. N. Kovalev, A. B. Sedov, V. P. Chil / / Actual questions of pharmaceutical and medical science and practice. Coll. scienc. art. – Zaporozhye: View – ZSMU, 2004. – Vol. XII, T. III. – P. 205–208.
Journal article	Medical ethics and human rights: the position of using animals in biomedical experiments / / Experimental and Clinical Physiology and Biochemistry. – 2003. – Vol. 22, № 2. – P. 108–109.
Abstracts (thesis)	Sydora, N. V. CHEMICAL RESEARCH OF HAWTHORNS FLOWERS LIPOPHILIC COMPOUNDS FROM UKRAINIAN FLORA / N. V. Sydora, A. M. Kovalyova //5 th International Sympostium on the Chemistry of Natural Compounds: abstr., 2013. – Buchara. – P. 284.
Dissertations	Kovaleva, A. M. Pharmacognostic study representatives from the family Fabaceae, Apiaceae, Convallariaceae, Asteraceae and prospects for their use in medicine: dis. ... PhD./ A. M. Kovaleva. – Kh.: NPhaU, 2002. – 478 p.
Abstracts of dissertations	Greenberg, L. A. P studying catchweed from Turkestan and growing in Uzbekistan: Abstr. dis. ... Cand. pharmacy. science / L. A. Greenberg. – M., 1971. – 15 p.
Patents	Patent for useful model 66282 Ukraine, IPC (2011.01) A61K 6/00 (72) A pharmaceutical composition "Kasdent" antimicrobial action and antyfunhalnoyu / Shulga L. I., Piminov A. F., Osolodchenko T. P.; owner Shulga L. I. – № u201107930; appl. 23.06.11; publ. 26.12.11.
Methodical recommendations	Preclinical studies of drugs: method. rec. / Ed. O. V. Stefanova. – K.: Avicenna, 2001. – 528 p.

Characteristics of the source	Example
Electronic Resources	Bubenchikova V. N. Study of substances primary biosynthesis from flea thyme herb (<i>Thymus pulegioides</i> L.) [electronic resource] / V. N. Bubenchikova, Ju. A. Starchak // Modern problems of science and education. – 2012. – № 3. – Mode access to journal. : URL: www.science-education.ru/103-6445 .

3.9. Appendices

They contain materials that complement work and have an informative character, but are too big to be placed in the text. To Appendices large tables, figures, diagrams and ect. are placed. Formatting rules are the same as in the general text (see below, "Making graphic materials").

Appendices are designated by letters starting with A or numbers. On the Appendices should be referenced in the text (for example, Appendix A).

Appendices are sequentially numbered and executed on separate pages. In the upper right hand corner the word "Appendix" and its number are written, under which symmetrically the title (name) with a capital letter are written. Pages of Appendices continue general page numbering of the work.

4. Master's work formatting rules

4.1. Text and page numbering

The text of work should be printed by font Times New Roman, size 14 pt, with 1.5 line spacing, text alignment – the width of the page. The work is printed on a white A4 paper sheet on one side, with margins: left – 30 mm, right – 15 mm, bottom and top – 20 mm; book orientation. The text paragraphs – indent (1.27 cm) at the beginning of each line of the text. Pages should be numbered in Arabic numerals and they are sequentially numbered throughout the text, beginning with the title page and ending with Appendices. The title page is not numbered.

Page numbers are put down, starting from a page with the heading "Contents" in the center or on the right-hand bottom corner of the page without the word page and punctuation.

4.2. Drawing up the graphic materials (figurs, diagrams, graphs)

Diagrams, figurs, graphs and other illustrations should be marked in the word "Figure" or "Fig.". Graphic materials should be placed after the text referencing to them, the signature is placed under the figure and is denoted as Fig. 1 (Name of the picture). Figures are numbered in Arabic numerals, sequentially within each chapter. Example of graphic materials layout is shown in Appendix 8.

Within the chapter number of the figure is indicates by two numbers, one is the chapter number, the other is the number of the figure in this chapter, numbers are separated by a point (Figure 1.1 – The first picture of the first chapter). Also references to the graphic materials (Example: Watch Fig. 1.1) and explanation (... as seen on Fig.1.1) are possible.

4.3. Drawing up the tables

In tables both theoretical and experimental (digital) materials are represented. Tables are printed in the text after the first mention of them and are sequentially numbered according to chapter number (Table 1.1 – first table of the first chapter). The word "Table" with its number is placed right on one line above a table. Then the name of the table (with the first capital letter) is placed. Point after the name is not written.

Orientation of the table is in the middle of the page. From the main text the Table must be separated by the single line (Appendix 7). In the text the reference to the Table (for example "see Table. 2.1" or "results are represented in Table 2.1") should be done.

Each Table title is written with a capital letter, a point after which is not written. During moving the Table to another page, name of the Table and graph titles are not repeated, and the appropriate numbering is put down and "Table.1.1 (continued)" is written.

4.4. Drawing up formulas

Formulas are made using tools of MS Word editor and they are stand out from the the text separately. Formulas are placed in the center of the line. Under the formula the decoding of symbols is written. Explanations of each symbol are given on a new line under the formula, in the order in which they are given in the formula. After the formula a comma is put, and the first line of the decoding starts with the word "where" without a

colon after it (Appendix 9). Within the chapter formulas are numbered similar to the figures. Number is put on the same line with the formula, on the right side in parentheses. In the brackets the reference to the sequence numbers of formulas, such as "in the formula (3)" is given.

4.5. Formatting of titles (headlines), structural parts of work

The text of the work consists of chapters that can be divided into subchapters, paragraphs and subparagraphs. Chapters are numbered in Arabic numerals; subchapters, paragraphs and subparagraphs are numbered within the previous structural element with the addition through the point numbers all previous structural elements (Example: 1.2.3 – the first chapter, subchapter 2, paragraph 3). The chapter titles are made by bold font, without underscores. It is desirable to make the name of the title of one sentence, if there are several sentences in the title, they are separated by points.

All titles of structural parts are arranged in a line and printed in capital letters, bold font, the point at the end is not put ("CONTENT", "INTRODUCTION", "EXPERIMENTAL PART", "CONCLUSIONS", "REFERENCES", "APPENDICES").

Each chapter is made out of a new page, chapters and paragraphs are printed with a capital letter, at the end of paragraph point is not put.

REFERENCES

1. Regulation and the Law of Ukraine "On Publishing".
2. State Standard of Ukraine DSTU 3017-95 "Edition. Main types. Terms and definitions".
3. The order granting the academic literature, the training and training equipment stamps and certificates of the Ministry of Education and Science of Ukraine. Decree № 537 of 17.06.2008.
4. Ukraine State Standard GOST 7.1:2006 "Systems standards of information bibliographical and publishing. "Bibliographic writing. Bibliographic description. General requirements and rules of making. "
5. Ukraine State Standard GOST 7.80-2007 "Bibliographic writing. Title. "
6. Ukraine State Standard GOST GOST 3582-97 "Abbreviations in the Ukrainian language, bibliographic description."

NATIONAL UNIVERSITY OF PHARMACY

Faculty _____
 Department _____
 Educational and qualification level _____
 Direction of training _____
 (code and name)
 Specialty _____
 (code and name)

APPROVED BY
Head of Pharmacognosy Department

“ ____ ” _____ 20__

T A S K

ON MASTER’S DEGREE WORK

 (full name of student)

1. Topic of master’s degree work _____

Supervisor of master’s degree work _____
 (full name of supervisor, scientific degree and academic rank)

approved by order of the NUPh from “ ____ ” _____ 20__ year
 № _____

2. Term for submission of work _____

3. Work base data _____

4. Content of settlement and explanatory notes (the list of issues that need work out)

5. List of graphic materials

6. Consultants of work sections (chapters)

Chapter	Surname, initials and title (staff) of consultant	Signature, date	
		task given	task accepted

7. Date of task issuing _____

CALENDAR PLAN

№	Name of Masters degree work stage	Term of work implementation	Note

Student

(signature)

(surname and initials)

Scientific supervisor

(signature)

(surname and initials)

NATIONAL UNIVERSITY OF PHARMACY

PROTOCOL № _____ from „____,“ _____ 20____
of the State Examination Commission meeting № _____

From consideration master degree work of student _____

(name of student)

Topic _____

PRESENT PERSONS:

Head _____

(full name, scientific degree and academic rank)

Members of SEC _____

Master's Degree work is completed:

under the direction _____

(full name, scientific degree and academic rank)

with consultation _____

(full name, scientific degree and academic rank)

TO THE STATE EXAMINATION COMMISSION SUCH MATERIALS ARE GIVEN:

1. Submission for the Head of SEC to the master's work defence, which contains information about the success, opinion leader, the Department conclusion

2. Explanatory note of master's degree on _____ pages

3. Presentation on _____ pages

4. Review _____

(full name, scientific degree and academic rank of recensent)

5. Academic student card

6. Summaries of the project in _____

indicate the language

After report (within ____ minutes) on masters work student was given the following questions:

1. _____
 (surname and initials of the person who asked the question, content of question)

2. _____

3. _____

4. _____

5. _____

TAKEN THE DCISION:

1. To recognize that student _____
 (name of student)

Completed and defended master's degree work with evaluation of a scale:
 national _____ ECTS _____

2. Assign _____
 (name of student)

qualification _____
 in the specialty _____
 (code, name)

3. Give a diploma _____

4. Note that _____

Head of SEC: _____
 (signature) (full name)

Members of SEC: _____

 (surname and initials and title of the person who prepared the report, signature)

NATIONAL UNIVERSITY OF PHARMACY

**SUBMISSION
FOR HEAD OF THE STATE EXAMINATION COMMISSION
FOR DEFENCE OF MASTER'S DEGREE WORK**

Student _____ for defence of master's degree work _____
(full name)

direction of training _____
specialty _____
(code and name)

On
topic: _____

Master work and review are attached.

Dean of the Faculty _____
(signature)

Scientific supervisor's conclusion on master degree work

Student _____

Supervisor of master's degree work _____
(signature)

Conclusion of Department about master's degree work

Student _____

Head of Pharmacognosy Department

(signature)

(name and initials)

“ ” _____ 20 ____ year

COMMENT

**of scientific supervisor on master's degree work of educational qualification level
of specialty** _____

_____ (full name of student)

on topic _____

Relevance of the topic _____

Practical interest of conclusions, recommendations and their reasonableness _____

Characteristic of work _____

General conclusion and recommendations about agreement for defence _____

Scientific supervisor _____

(signature)

(surname and initials)

« _____ » _____ 20 ____ year

REVIEW

on master's degree work _____
 (full name of student)

on topic _____

Relevance of the topic _____

Theoretic level of work _____

Proposals to the author on the topic of research _____

Practical interest of conclusions, recommendations and their reasonableness

Disadvantages of work _____

General conclusion and opinion about the work _____

Reviewer _____

(signature)

(scientific rank, surname and initials)

« _____ » _____ 20 ____ year

Title page of Master's Degree work

**MINISTRY OF PUBLIC HEALTH OF UKRAINE
NATIONAL UNIVERSITY OF PHARMACY**

Foreing students faculty

Pharmacognosy Department

MASTER'S DEGREE WORK

On topic _____

Performer: student ____ course, group _____
direction of training (specialty)

(full name)

Scientific supervisor _____

(full name, scientific degree and academic rank)

Rewiever _____

(full name, scientific degree and academic rank)

Kharkiv – 20____ year

APPENDIX 7

Table 1

Pharmacopoeia species of *Crataegus* L. genus

№	English name of the plant	Latin name of the plant	Name of herbal drugs

APPENDIX 8

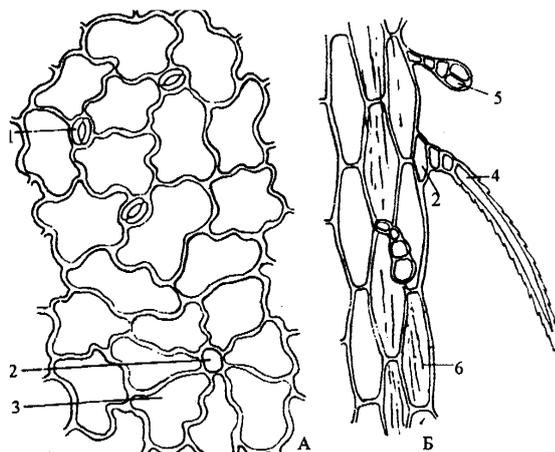


Fig. 1 Epidermis of Sweet clover herb

APPENDIX 9

Content of tannic compounds X, %, was calculated using formula:

$$X = \frac{(V - V_1) \cdot K \cdot V_{заг} \cdot 100 \cdot 100}{m \cdot V_{\partial / aH} \cdot (100 - W)}, (1)$$

V – volume of potassium permanganate solution used for titration, ml;

V₁ – volume of potassium permanganate solution used for titration in control test;

K – amount of tannic compounds, corresponding to 1 ml 0,02 mole/l of potassium permanganate solution, g: for condens tannic compounds it's 0,00582, for hydrolysable tannic compounds (in recalculation on tannin) – 0,004157;

m – mass of herbal drugs, g;

W – lost in mass during drying, %;

V_{gen} – general volume of extract, ml;

V_{for/ an.} – volume of extract for titration, ml.

EDUCATION EDITION

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METHODICAL RECOMMENDATIONS FOR THE IMPLEMENTATION OF THE MASTER'S DEGREE WORK ON PHARMACOGNOSY

FOR FOREING STUDENTS

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